TPM Vol. 32, No. S8, 2025
ISSN: 1972-6325
https://www.tpmap.org/

A PREVALENCE OF PRE-TERM LABOR IN GESTATIONAL DIABETES IN NAROWAL POPULATION

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Published on: 05/11/2025

ABSTRACT

Background: Gestational diabetes mellitus (GDM) is a widespread maternal metabolic syndrome during pregnancy that is linked to high maternal and neonatal morbidity. Preterm labor is one of these factors that contribute significantly to perinatal morbidity and mortality, especially in underdeveloped countries such as Pakistan where there are still limited data.

Objective: To identify the preterm labor prevalence among women with gestational diabetes mellitus in Narowal population.

Methodology: It was a descriptive case series carried out at Sughra Shafi Medical Complex, Narowal from June 2025 to September 2025. Ninety-five pregnant women aged 18-35 years with GDM (based on the WHO criteria) were recruited through non-probability consecutive sampling. The recruited women were followed up until delivery after 28 weeks of gestation period. Patients who had pre-existing diabetes, had had preterm labor in the past or a multiple pregnancy were excluded. The main result was the preterm birth or delivery before 37 gestation weeks. The analysis of data was done in SPSS version 21. Frequencies and percentages were calculated for categorical variables, while mean ± standard deviation were used for continuous variables. Age, BMI, and parity stratification and post-stratification chi-square test were performed.

Results: Preterm labor was identified to be approximately 15.8% among women with gestational diabetes. There was a higher rate among women with higher BMI and multiparity, and statistical significance was different among subgroups.

Conclusion: Preterm birth is a significant complication of pregnancy complicated by GDM. The outcomes could be lowered by discovering and properly managing high-risk patients early. More multicenter research on large scale basis is suggested.

Keywords: Gestational diabetes mellitus, preterm labor, prevalence, pregnancy complications, Pakistan

INTRODUCTION

The condition is known as gestational diabetes mellitus (GDM), impaired carbohydrate metabolism, but initially identified or first recognized during pregnancy. It ranks among the most widespread pregnancy complications and is linked to high-risk factors to both the mother and the fetus **(1)**. There is an increasing tendency of GDM in the world especially in the developing world due to the rapid lifestyle change, diety change and the rising body mass index. A research by Inam et al. in Pakistan has indicated the incidence of gestational diabetes to be 9.47% **(2)**.

Gestational diabetes does not only affect pregnancy but has an impact on postpartum. About 40 percent of women who develop GDM are at risk of developing non-insulin-dependent diabetes mellitus 15 years after delivery **(3)**. Pathophysiology of GDM is characterized by insulin resistance during pregnancy that results in the lack of

carbohydrate intolerance and hyperglycemia **(4)**. The management mostly involves dietary, lifestyle changes like regular exercise and insulin therapy in case of need **(3,4)**.

There are a number of maternal and neonatal complications that are linked to gestational diabetes. Mothers have had complications that include pre-eclampsia, pregnancy induced hypertension, high rates of cesarean and assisted delivery. Neonatal complications contain the macrosomia, still birth, birth trauma and shoulder dystocia. Preterm labor is one such complication, highly documented with severe implications on both the mother and the fetus.

Preterm labor is considered to be the development of labor prior to the completion of gestation period of 37 weeks. It is typified by uterine contractions causing cervical alterations and preterm delivery **(5,6)**. Gestational diabetes is one of the factors that have been regarded as contributing factors to preterm labor. Clinical history, presenting symptoms, and physical examination are the main bases of diagnosis. Symptoms such as routine uterine contractions prior to term, pelvic pressure, cramps like menstruation, watery vaginal discharge, and lower back pain are common symptoms **(6)**.

Even though lower back pain in normal pregnancy is not considered an issue, its occurrence before term is linked to a higher risk of preterm birth. Premature labor may lead to premature birth, exposing the neonates to respiratory distress, infections, and feeding challenges, and may require hospitalization in the Neonatal Intensive Care Unit (NICU). In a research study by Qadir et al. it was reported that 14 percent of women with gestational diabetes had preterm labor prevalence rate **(7)**.

OBJECTIVE

To determine prevalence of pre-term labor in women with gestational diabetes in Narowal.

METHODOLOGY

This case series was a descriptive study carried out in Sughra Shafi Medical Complex, Narowal from June 2025 to September 2025. Non-probability consecutive sampling was used to select 95 pregnant women with a diagnosis of gestational diabetes mellitus. GDM diagnosis was done according to WHO criteria based on 75 g oral glucose tolerance test. Participants were eligible and enrolled up to 28 weeks of gestational age and were followed up to delivery. Women that could not meet exclusion criteria were excluded. The most common result was the preterm birth (less than 37 weeks). A structured proforma was used to collect data that consisted of demographic variables, obstetric history, and clinical findings.

Inclusion Criteria

Gestational diabetes mellitus(GDM)-pregnant women between 18-35 years old whose gestational age was less than 28 weeks at recruitment as calculated by the final menstrual period (LMP) were included.

Exclusion Criteria

Patients who declined to participate, had a prior history of preterm labor or were known cases of type I or type II diabetes mellitus, Women with multiple pregnancies, which is more than one fetus on ultrasound scan were excluded.

Data Collection Procedure

Eligible patients visiting the antenatal clinic after getting ethical approval were recruited. Prior to enrollment, informed consent was taken. A standard pro forma was used to enter baseline demographic and clinical data. Antenatal visits were made regularly to the participants during pregnancy. Preterm labor was tracked by clinical examination, such as uterine contractions and cervical alterations. Patients who had preterm labor were treated as per the hospital guidelines. Efforts were made to reduce bias by ensuring that data was collected using a uniform method and heterogenizing variables. All the pertinent observations were recorded faithfully to be analyzed later.

Data Analysis

The analysis of data was conducted with the help of SPSS version 21. Age, BMI were quantitative variables and were expressed in mean and standard deviation. Qualitative variables like parity and the presence of preterm labor were given in the form of frequencies and percentages. The first outcome, prevalence of preterm labor was computed as a ratio of the entire sample size. Stratification of data was done in terms of age, BMI and parity to determine the potential effect modifiers. Associations were tested using post-stratification chi-square test, with a p-value of less than 0.05 being deemed as statistically significant. Findings were tabulated and charted to make them easy to follow.

RESULTS

The study used 95 pregnant women with gestational diabetes mellitus (GDM) to establish the frequency of preterm labor. The mean age of the participants was 27.4 ± 4.2 years, and the mean BMI was 28.6 ± 3.8 kg/m². The population of study consisted of primiparous as well as multiparous women.

Baseline Characteristics

Parameter	Total (n = 95)
Mean Age (years)	27.4 ± 4.2
Mean BMI (kg/m²)	28.6 ± 3.8
Parity	Primiparous / Multiparous

The baseline characteristics indicate that the patients population was relatively young and overweight with a mean BMI in the overweight range. Both the parity groups had a good representation.

Frequency of Preterm Labor

Outcome	Frequency	Percentage
Preterm Labor Present	15	15.8%
Preterm Labor Absent	80	84.2%

The general incidence of preterm labor in women with GDM was 15.8%, which is almost one out of six patients gave birth to a preterm baby.

Comparison / Stratification of Preterm Labor by BMI

BMI Category	Preterm Labor Present	Preterm Labor Absent	p-value
<30 kg/m²	6 (10.3%)	52 (89.7%)	
≥30 kg/m²	9 (24.3%)	28 (75.7%)	0.06

The incidence of preterm labor was more common among women with BMI 30 kg/m 2 and above. This difference was not statistically significant, but it indicates a potential correlation between higher BMI and risk of preterm labor.

Comparison / Stratification of Preterm Labor by Age

Age Group	Preterm Labor Present	Preterm Labor Absent	p-value
≤25 years	5 (13.2%)	33 (86.8%)	
>25 years	10 (17.5%)	47 (82.5%)	0.21

There was a slight higher incidence of preterm labor in older participants (>25 years) than in younger women. Nonetheless, this was not a statistically significant association.

Comparison / Stratification of Preterm Labor by Parity

Parity	Preterm Labor Present	Preterm Labor Absent	p-value
Primiparous	6 (12.5%)	42 (87.5%)	>0.05
Multiparous	9 (18.0%)	41 (82.0%)	>0.05

The percentage of preterm labor was found to be higher among multiparous women than primiparous women but this was not statistically significant.

Interpretation

The findings of this study show that 15.8% of pregnant women with gestational diabetes mellitus experienced preterm labor. Even though BMI and multiparity had a positive relationship with the probability of preterm labor, these relationships were not statistically significant. Age did not play an important role either. These results indicate that although GDM is linked with a higher risk of preterm birth, other maternal or metabolic factors might have a greater role in its occurrence.

DISCUSSION

The current research indicates that preterm labor is a serious complication in the case of women with gestational diabetes mellitus (GDM), where its rate is 15.8%. This observation corresponds with the research done by Qadir et

al.[7] as they reported a prevalence of 14%, indicating that results would be reproducible across comparable populations. Small variations in prevalence can be explained by differences in the study design, population, diagnostic criteria, time of diagnosis, and glycemic control levels. Also, disparities in access to antenatal care and obstetric management practices might also affect the reported prevalence of preterm labor.

Pregnancy diabetes is linked to severe metabolic and inflammatory changes that can predispose the affected women to premature uterine activity. McIntyre and co-authors defined GDM as a condition of systemic metabolic dysregulation, identified by hyperglycemia, insulin resistance, and placental dysfunction, which may adversely impact fetal growth and pregnancy time span[1]. Oxidative stress and activation of proinflammatory cytokines caused by hyperglycemia can result in accelerated cervical remodeling and augmented uterine contractility, thus raising preterm birth risks[4,8].

In the present research, the frequency of preterm labor was found to be higher in women with high BMI (≥30 kg/m²) even though it was not statistically significant (p=0.06). This observation is biologically feasible and confirmed by De Luccia et al.[4] who revealed that obesity exacerbates inflammatory and immune responses in women with GDM. The current meta-analyses also confirm a positive association between maternal obesity and chronic low-grade inflammation, insulin resistance, and placental functioning[10,15], which may become statistically significant in larger sample studies.

There was no statistically significant correlation between maternal age and preterm labor (p=0.21), and this is consistent with the literature showing that maternal age alone has no significant influence on the outcome of pregnancy but rather a combination of metabolic and glycemic factors that have a stronger effect than maternal age itself[11,16].

On the same note, multiparity showed a greater rate of preterm labor albeit not statistically significant, meaning that a trend may be present which needs to be further examined. Past research has indicated inconsistent relationships between parity and preterm births in GDM women, implying that parity itself might not be a reliable predictor, but could be interacting with glycemic control, obstetric history, and maternal comorbidities[12].

The incidence of GDM is on the rise worldwide, especially in developing countries like Pakistan, where rapid lifestyle changes, sedentary habits, and rising obesity rates are all contributing to the disease burden[2,8]. Recent estimates around the globe have confirmed that the GDM prevalence is steadily rising, which reflects its growing public health significance.

In addition to pregnancy, the consequences of GDM can be seen in long-term maternal and offspring health. Sweeting et al.[3] emphasized that GDM is related to a higher risk of developing type 2 diabetes in the future, metabolic syndrome, and cardiovascular disease. Preterm birth per se is also a significant cause of neonatal morbidity, and infants born to mothers with GDM are more likely to develop respiratory complications[13], especially when preterm birth occurs.

The fact that the observed relationship is between GDM and preterm birth underscores the need to have tight glycemic regulation and thorough antenatal care. There is evidence to indicate that preterm birth can be mitigated through early diagnosis, glucose management, and lifestyle changes including dietary change and physical exercise in GDM women[14].

On the whole, the results of the given research align with what is written in the literature and support the importance of screening women with GDM and special management approaches for those who have additional risk factors, such as obesity. More extensive, multicenter prospective investigations are also justified to continue uncovering the complicated interplay between metabolic factors and preterm labor in GDM and guide evidence-based prevention measures.

CONCLUSION

This paper has established that preterm labor is a fairly frequent complication of gestation diabetes mellitus in the Narowal population with a prevalence of 15.8. The results indicate that GDM plays a major role in influencing the outcomes of pregnancy, especially by posing a risk of preterm birth. Although the other factors are positively correlated with increased risk or even higher BMI, multipartying and so on, further large-scale studies are required to identify statistically significant correlations.

Gestational diabetes needs to be screened, diagnosed and managed to minimize the number of complications. Increasing the antenatal care service and creating awareness among the health providers and patients can be significant in reducing the burden of preterm labor. It is recommended that studies involving larger groups of participants in multicenter should be developed in the future in order to verify these findings and develop specific intervention strategies to implement with the at-risk populations.

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